53D CONGRESS, 1st Session. } HOUSE OF REPRESENTATIVES. { Ex. DOC. No. 20.

PAYMENT TO CONTRACTORS FOR CONSTRUCTION OF VESSELS FOR THE NAVY.

LETTER

FROM

THE SECRETARY OF THE NAVY,

TRANSMITTING,

Pursuant to House resolution of the 11th instant, information relating to payments made to contractors for construction of vessels for the Navy on account of speed, etc.

OCTOBER 19, 1893.—Referred to the Committee on Naval Affairs and ordered to be printed.

NAVY DEPARTMENT,
Washington, October 18, 1893.

SIR: Referring to the resolution of the House of Representatives, dated the 11th instant, calling upon this Department for information relating to payments made to contractors for the construction of vessels for the Navy on account of speed developed by such vessels upon trial in excess of the contract requirements, I have the honor to inclose herewith a joint report, in relation to the matter, of the chiefs of the Bureaus of Construction and Repair and Steam Engineering, which, it is believed, contains full information concerning all the matters comprehended in the resolution.

Very respectfully,

H. A. HERBERT,
Secretary of the Navy.

The SPEAKER OF THE HOUSE OF REPRESENTATIVES.

NAVY DEPARTMENT,
Washington, D. C., October 16, 1893.

SIR: (1) In reply to the Department's indorsement of the 11th instant on the resolution of the House of Representatives calling for information as to the amount paid contractors as premiums for increased speed, we respectfully submit the following:

(2) The accompanying Table I gives the amount of premium paid or due on account of increased speed for naval vessels which have been tried under speed requirements.

The total amount is $690,000.
Of this amount

The Wm. Camp & Sons Ship and Engine Builing Company received	$300,000
Union Iron Works received	100,000
The Columbian Iron Works and Dry Dock Company are entitled to	150,000
Bath Iron Works are entitled to	95,000
The S. L. Moore & Sons Company are entitled to	45,000

(3) Table II gives a list of the vessels which have been tried under requirements for horse power.

(4) The total amount of money paid contractors on these trials, less that deducted for penalties on account of failure to develop the required power, was $120,094, distributed as follows:

	Premiums.	Penalties.
The Wm. Cramp & Sons Ship and Engine Building Co	$183,124	
Union Iron Works		$66,607
N. F. Palmer, jr., & Co	4,062	
Columbian Iron Works and Dry Dock Co		485
Total	187,186	67,092

Excess of premiums over penalties, $120,094.

(5) The pressure carried on the boilers of the *Bancroft* was 7 pounds greater than the pressure which they were designed to carry in continuous service; 10 pounds greater on the *Detroit;* 15 on the *New York;* 3 on the *Machias*, and 1 on the *Castine.* The increase on the two latter is insignificant, and may be neglected. The excess in the case of the *Bancroft* is less than 5 per cent, which we believe to be within the limits of precision of the steam gauges.

(6) In the case of the *New York*, although the pressure on the boilers was 15 pounds more than they will carry in service, this had no effect on the final result, because the steam was throttled at the engine. The same result might have been obtained by carrying the steam at 160 pounds in the boilers and opening the throttle wide at the engine.

(7) In the case of the *Detroit*, where the pressure was 10 pounds in excess, it was necessary to carry the higher pressure in the boiler in order that the engines might work off all the steam the boilers would furnish. By making modifications in the screws, altering the pitch, surface, and diameter, the engines would without doubt work off all the steam the boilers could furnish at 160 pounds, and the ship would probably make more speed than she did on this trial.

(8) In all these trials it has been the custom of the Department to allow the contractors a great deal of latitude in running the engines, as upon them devolves the responsibility for a failure of any kind or for an unsuccessful trial, and their methods have not always been those the Department would follow to attain the same result.

(9) The first trial of the *Baltimore* was unsuccessful, she falling short about 22 horse power. The contractors thought they could do better on a second trial, which was allowed them. After making a number of alterations in the machinery, the second trial was made two months after the first one, when the horse power developed was upwards of a thousand more than that required.

(10) The boilers of these ships have been designed with a large factor of safety, and have been tested to a pressure of 250 pounds per square inch. Every piece of metal in them had been subjected to the most rigid inspection, and the work has been carefully supervised as it

progressed, and so far as their strength is concerned there need be no misgivings.

(11) In powering our ships it has been the practice of the Department to give them ample boiler power, for it is in this respect that foreign war vessels are most deficient, so much so that Great Britain has deemed it unwise to subject the prototype of the *New York* and a number of other vessels to a test under full power with forced draft. That our practice has been a wise one may be inferred from the fact that we have yet to record a failure of one of our boilers on trial.

(12) It is our belief that such a practice has not resulted in giving contractors large premiums for increased speed; it has rather had the effect of getting lower bids than would have been possible had the power been barely sufficient for the contract speed; for contractors, in making their estimates, must, if they are anxious to get the contract, take into consideration the probability or the certainty of a premium for increased speed and adjust their bids accordingly. This point is amply illustrated in the case of the *Detroit* and two sister ships. When the first bids for their construction were opened it was found that all of them were greater than the amount appropriated by Congress. This was because the speed required was 18 knots, the contractors believing that even with a slightly greater speed there was no money in them. The Department accordingly reduced the requirement to 17 knots, keeping the same specifications for construction, which was equivalent to increasing the appropriation $100,000, and the bids received showed that at least one of the bidders had figured on a speed of more than 18 knots an hour and consequent premium.

(13) Finally, we do not believe that any increase of speed has resulted from the increased boiler pressure carried on the vessels in question. When the designs were made it was contemplated that the pressure at the engine would be 160 pounds on trial. In the *Machias* it was 160, in the *Castine* 159, in the *Bancroft* 163, in the *Detroit* 163, and in the *New York* 169. In the latter case the engine throttle valves were partially closed; if they had been run wide open the pressure in the boilers would probably have been less than 160 pounds, but there would have been no difference in the speed maintained. In the case of the *Bancroft* and *Detroit* premiums were paid on a basis of 14.25 and 18.50 knots, respectively, and as they made 14.37 and 18.71 knots, the contractors gained nothing by carrying three pounds additional pressure.

Very respectfully,

PHILIP HICHBORN,
Chief Constructor, U. S. Navy,
Chief of the Bureau of Construction and Repair.
GEO. W. MELVILLE,
Engineer in Chief, U. S. Navy,
Chief of the Bureau of Steam Engineering.

The SECRETARY OF THE NAVY,
Navy Department, Washington, D. C.

TABLE I.—*Naval vessels tried under a requirement for speed.*

Name of ship.	Date of—			Speed in knots.	
	Trial.	Law authorizing construction.	Law fixing premium.	Trial.	In excess of that required.
Philadelphia	June 25, 1890	Mar. 3, 1887	Mar. 3, 1887	19.68	0.68
San Francisco	Aug. 27, 1890	....do	....do	19.52	0.52
Bancroft	Jan. 26, 1893	Sept. 7, 1888	Sept. 7, 1888	14.37	2.37
Detroit	Apr. 17, 1893	....do	....do	18.71	*1.71
New York	May 22, 1893	....do	....do	21.00	1.00
Machias	June 10, 1893	Mar. 2, 1889	Mar. 2, 1889	15.46	2.46
Castine	Sept. 15 1893	....do	....do	15.62	2.62
Vesuvius	May 10, 1890	Aug. 3, 1886		21.646	1.646

Name of ship.	Premium.		Steam pressure.		Duration of trial.
	Earned.	To whom paid.	In boilers.	For which designed.	
			Pounds.	*Pounds.*	
Philadelphia	$100,000	William Cramp & Sons.	160	160	Four hours.
San Francisco	100,000	Union Iron Works	135	135	Do.
Bancroft	†45.000	S. L. Moore & Sons	167	160	Do.
Detroit	†150,000	Columbian Iron Works.	170	160	Do.
New York	200,000	William Cramp & Sons.	175	160	Do.
Machias	†45,000	Bath Iron Iron Works..	163	160	Do.
Castine	†50,000	....do	161	160	Do.
Vesuvius	None		160	No record.	Two runs over a 2.05 knot course.

*The original advertisement for the construction of the *Detroit* called for a speed of 18 knots on trial. The bids received were greater than the appropriation, and the vessel was again advertised the speed requirement being reduced to 17 knots. This had the effect of increasing the amount of the appropriation by $100,000; so that the premium paid is virtually $50,000.

†This premium has not yet been paid and is subject to the approval of Congress.

‡This premium has not yet been paid.

TABLE II.—*Naval vessels tried under a requirement for horse power.*

Name of ship.	Date of—			Indicated horse power.		
	Trial.	Law authorizing construction.	Law fixing premium.	Trial.	In excess of that required.	Less than that required.
Dolphin	May 28, 1885	Mar. 3, 1883	None	2,240		60
Atlanta	Apr. 13, 1887	....do	None	3,345		155
Boston	Sept. 6, 1887	....do	None	3,780	280	
Chicago	Dec. 22, 1887	....do	None	5,084	84	
Yorktown	Feb. 13, 1889	....do	Sept. 7, 1888	3,398.25	398.25	
Charleston	Aug. 23, 1889	....do	Sept. 7, 1888	6,666.16		333.84
Baltimore	Sept. 14, 1889	Aug. 3, 1886	....do	8,977.88		22.12
	Nov. 15, 1889			10,064.42	1,064.42	
Petrel	Aug. 19, 1889	Mar. 3, 1885	....do	1,095.15		4.85
Newark	Dec. 22, 1890	Mar. 23, 1885 / Mar. 3, 1887	....do	8,868.57	368.57	
Concord	Jan. 13, 1891	....do	....do	3,404.53	4.53	
Bennington	Apr. 2, 1891	....do	....do	3,436.09	36.09	
Monterey	Jan. 5, 1893	....do	....do	5,072.77		327.23

Name of ship.	Premium earned.	Penalty imposed.	To or by whom paid.	Steam pressure.		Duration of trial.
				In boilers.	For which designed.	
Dolphin		None		86	90	Six hours.
Atlanta		None		89	90	Do.
Boston	None			87	90	Do.
Chicago	None			90	90	Do.
Yorktown	$39,825		William Cramp & Sons..	160	150	Four hours.
Charleston		$33,884	Union Iron Works	91	90	Do.
Baltimore		Contractors allowed another trial		122	135	Do.
	106,442		William Cramp & Sons.	135	135	Do.
Petrel		485	Columbian Iron Works.	90	100	Do.
Newark	36,857		William Cramp & Sons.	162	160	Do.
Concord	453		N. F. Palmer, jr., & Co ..	164	160	Do.
Bennington	3,609		....do	166	160	Do.
Monterey		32,723	Union Iron Works	155	160	Do.